

January 18, 1968

To: Forest Supervisors: Chippewa, Superior, Ottawa,
Hiawatha, Chequamegon, Nicolet and Huron-Manistee

From: L. H. Moore, Field Representative

Subject: Forest Insect and Disease Evaluation (Saratoga
spittlebug biological evaluation)

Attached is the St. Paul Field Office's biological evaluation of the Saratoga spittlebug situation on the Chequamegon, Nicolet, Ottawa, Hiawatha and Huron-Manistee National Forests. At this time we are recommending that you consider suppression as indicated in the evaluation.

The biological evaluation will provide the basis for you making the cost-benefit evaluation and the adverse effects evaluation. Your final decision for or against suppression will depend on a penetrating analysis of all three evaluations. If necessary, we in the Field Office will provide technical assistance to you when you make the cost-benefit and adverse effects evaluations. If your final decision is for suppression you should submit as soon as possible four copies each of all three evaluations plus four copies of Form 5200-10 (7/66), Forest Insect and Disease Control Project Proposal, to the Regional Office.

Maps of the infested plantations have not been completed yet. They will be forwarded to you as soon as they are completed.

L. H. Moore

ECOLOGICAL EVALUATION OF THE SARATOGA
SPITTLEBUG SITUATION ON THE CHEQUAMEGON, HIAWATHA,
NICOLET, OTTAWA, MANISTEE, AND HURON N. F.

C.Y. 1967

A. Introductory Statement

The Saratoga spittlebug continues to be a major pest of red pine plantations in the Lake States. Generally, Saratoga spittlebug populations remained high on the Nicolet and Chequamegon National Forests in Wisconsin during C.Y. 1967. With the exception of the Rapid River District on the Hiawatha N. F. and the Harrisville District on the Huron N. F., Saratoga spittlebug populations are generally low on National Forest land in Michigan.

This evaluation is based entirely on the scar-count surveys that were undertaken on the Nicolet, Huron, Chequamegon, Ottawa, Manistee and Hiawatha National Forests this fall. On the basis of these surveys a total of 1330 acres are recommended to be nymphal surveyed next spring, C.Y. 1968. Scar-count surveys on the Chippewa and Superior National Forests have not been completed; therefore, nymphal surveys on these Forests cannot be recommended at this time.

B. Technical Information

1. Causal Agent - Aphrophora saratogensis(Fitch), the Saratoga spittlebug.
2. Host Tree - Pinus resinosa Ait., red pine, is the primary host. Generally, damage is restricted to those trees between 3 and 15 feet in height, particularly those trees in the 4 to 10 foot category.
3. Type of Damage - Specific damage, i.e., top-killing, tree mortality, flagging and growth reduction, was not reported by the Forests when they made the scar-count surveys. However, some of the scar-count data (see attached scar-count sheet) indicates that such damage can be expected.
4. Biological Data - The exact effectiveness of parasitism and/or predation is not known. In general, it is believed that Saratoga spittlebug parasites and predators have little effect in suppressing

spittlebug populations.

5. Environmental Factors - Late heavy spring frosts or extremely dry spring weather can have a limiting effect on Saratoga spittlebug populations. However, these two conditions have to be fairly extreme for the effect to be successful in suppressing populations; particularly so since the nymphs are insulated considerably from the macro-environment by their habit of forming the spittle masses below the litter line at the base (root collar) of host plants; the mass itself creates a very effective and favorable micro-climate.
6. Extent of Outbreak - 192 acres on the Nicolet N.F., 457 acres on the Chequamegon N.F., 19 acres on the Ottawa N.F., 45 acres on the Manistee N.F., 90 acres on the Hiawatha N.F. and 527 acres on the Huron N.F.
7. Location of Outbreak - See attached maps.
8. Discussion - This evaluation is based entirely on the scar-count surveys. Next spring a St. Paul Field Station entomologist will survey the plantations included in this report to determine what effect the heavy spittlebug feeding is having on the trees. The inherent vigor of a particular plantation can have a considerable effect on just how much spittlebug feeding it can tolerate before it begins to exhibit typical Saratoga spittlebug damage. Generally, a plantation should be scheduled for Saratoga spittlebug suppression when 30% of the trees are heavily damaged (30+ scars/4 inches of 2 yr. old internode). In addition, possible suppression can be scheduled for a plantation if 30% of the trees exhibit medium damage (10-30 scars/4 inches of 2 year old internode) and heavy damage; this is because the spittlebug population causing the medium damage has a chance of increasing to a heavy damage population after it has gone through the propagative stage.

An average of about one Saratoga spittlebug nymph per tree unit - a tree unit equals the product of average tree height (in feet) x average number of living branch whorls x average number of trees/acre - will result in approximately 35 scars/4 inches of 2 year old internode. This degree of feeding usually results in serious tree damage.

9. Recommendations - All of the plantations included in this report should be Saratoga spittlebug nymphal surveyed during June, 1968. Those plantations recommended for suppression on the basis of the June nymphal survey will be scheduled for resurvey in July to determine development rate. Exact timing of all surveys will be determined by the St. Paul Field Office.

For planning purposes, the plantations marked with an asterisk, (see attached scar-count sheet) should be scheduled for suppression next summer. The remaining plantations need only be scheduled for tentative suppression at this time since Saratoga spittlebug past history indicates that, generally, damaging populations do not develop very rapidly but take several years to do so.

.5 lb. Malathion/acre is recommended for the suppression operation. If aerial application (fixed wing or helicopter) is selected for the suppression operation low volume application of the Malathion is recommended. If back-pack mist blower application is selected, conventional application (57% E.C. Malathion in 1-2 gallons of water/acre) is recommended. Aerial application costs should be approximately \$2.50/acre. Back-pack mist blower costs should be approximately \$5.00/acre. These approximate costs include only the chemical and actual applications.

SCAR-COUNT DATA

<u>Forest</u>	<u>District</u>	<u>Plan#</u>	<u>Acreage</u>	<u>Hvy</u>	<u>Med.</u>	<u>Ave. No. Scars</u>
Chequamegon	Hayward Washburn	62e	23	0	42	9
		110b	42	4	50	10.5
		118c	31	0	30	7.5
		*116d	64	4	96	20
		108-9	37	0	29	7.5
		110a	28	9	18	7
		118a	25	0	35	9
		118e&f	133	1	34	9
		*112a,a,c,&d	38	9	56	16.5
		118f	31	4	44	10.5
		Total	457			
Hiawatha	Rapid River	17bR	22	0	65	12
		17aR	45	4	35	10
		20a	23	data not available		
		Total	90			
Nicolet	Florence	*6i				
		(East blk)	10	20	40	19
		6c	35	0	30	5.5
	Lakewood	8f	15	7	27	6.5
		*2	15	20	53	21
		*9a	6	30	30	27
		T.31 R.15 S.60	36	0	50	10
		9c	27	0	25	5
	Three Lakes	T.31 R.16 S.18	6	0	40	7.5
		24c	28	5	33	12
		46b	14	0	30	9
		Total	192			

Forest	District	Plan#	Acreage	Hvy	Med.	Ave.	No.	Scars
Ottawa	Watersmeet	*6008	19.	5	33		12	
		Total	<u>19</u>					
Manistee	Baldwin	*P-39	30	20	40		20	
		*P-41	15	15	26		15	
		Total	<u>45</u>					
Huron	Harrisville	T.26 R.8 Sec.8	208	11	36		10.5	
		*T.26 R.8 Sec.4	38	57	29		23.5	
		*T.26 R.7 Sec.20	34	68	16		23.0	
		70	7	10	40		13.0	
		*T.26 R.6 Sec.1	80	90	0		28.0	
		*T.26 R.6 Sec.19	80	10	65		15.5	
	Tawas	T.24 R.4 Sec.24 &	25	5	53		11.0	
		25	25					
	Mio	*T.26 R.1 Sec.23	55	25	35		16.0	
		Total	<u>527</u>					
		Grand Total	1330					